Space Weather Forecast

Issued on Tuesday, 11 April 2023 at 00:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of M-class flares (R1-R2 Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one Moderate flare observed from a new but small sunspot on the southeast limb. This region is gradually rotating into view, and further details of it are likely to become apparent as it rotates into view. The other main sunspot is situated in the southeast quadrant. This consists of a large number of individual small spots, with ongoing development, and some slight magnetic complexity. There are three other sunspot regions currently on the disc, however these are smaller and simpler, but with a general growth trend. There are no Earth-directed CMEs (coronal mass ejections) that have been observed.

Solar Wind / Geomagnetic Activity: The arrival of a weak 'transient', which is similar to a CME, but weaker and harder to see when they occur, was then followed by a transition into the fast winds that come from a coronal hole. Initially the speed of the solar wind was slow, at below 350 km/s but rose during the morning due to this fast wind to reach 550km/s. The magnetic field, however also showed the initial transient, as it was Moderately strong, with its north-south component persistently southward pointed. As Earth moved into the fast wind however, this rotated to be mainly positive (northward), although still Moderate in strength. The resultant geomagnetic activity was Quiet to Active (Kp 2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary.

Solar Activity: Low to Moderate, with a chance of further isolated Moderate flares. The eastern side of the disc is the most likely source for this, with two notable sunspot regions.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs, although there is with a low possibility of a glancing arrival from a CME which let the Sun on the 7 Apr, either late day 1 or early day 2 (11 or 12 Apr). Ongoing slightly elevated winds are expected, with further coronal hole sourced enhancements possible, however any geomagnetic activity is likely to remain limited. Mainly Quiet activity expected with a chance of Unsettled intervals and a very slight chance of Active if any CME arrival occurs.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to remain at background levels, with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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